

(12) UK Patent Application (19) GB (11) 2 164 231A

(43) Application published 19 Mar 1986

(21) Application No 8522273

(22) Date of filing 9 Sep 1985

(30) Priority data

(31) 8422897 (32) 11 Sep 1984 (33) GB

(51) INT CL⁴
A01B 63/26 A01D 34/54

(52) Domestic classification
A1B PA2 UA1
A1F FD

(56) Documents cited
GB 1566605 GB 1089843
GB 1447501 GB 0424031
GB 1446732

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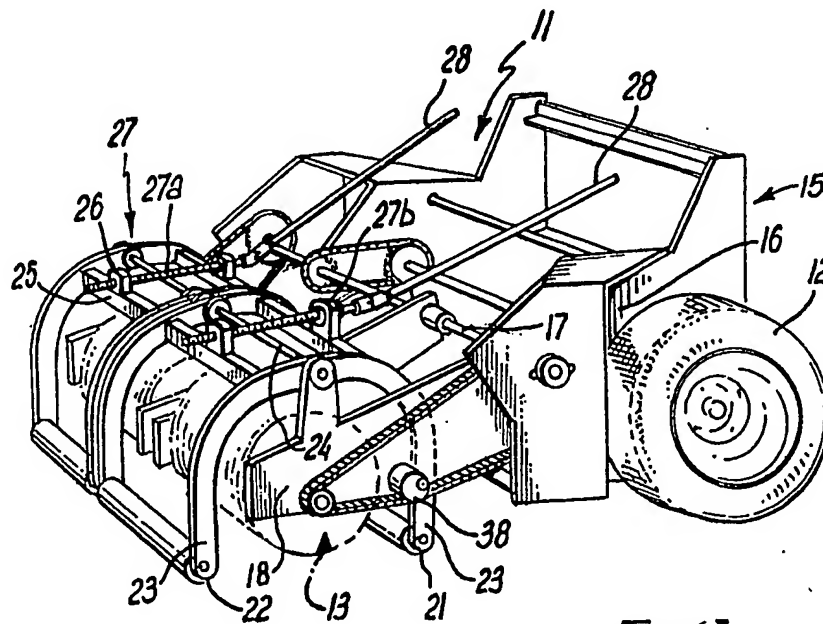
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(58) Field of search
A1B
A1F

(54) Turf-care apparatus

(57) Turf-care apparatus (11) for drawing behind a tractor includes two units pivotally mounted on driven bar (17), each unit comprising a rotatable cylinder (13) and spaced support rollers (21, 22) before and after the cylinder (13), the rollers (21, 22) being adjustable to vary the position of the cylinder (13) relative to the surface to be treated. The cylinders may effect a scarifying operation or a cutting operation.



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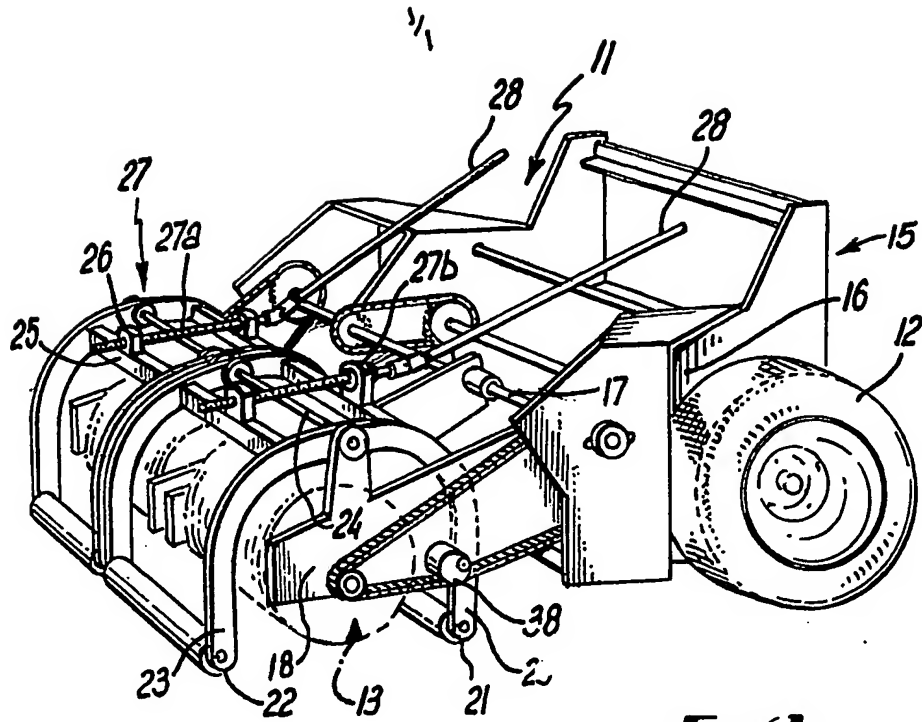
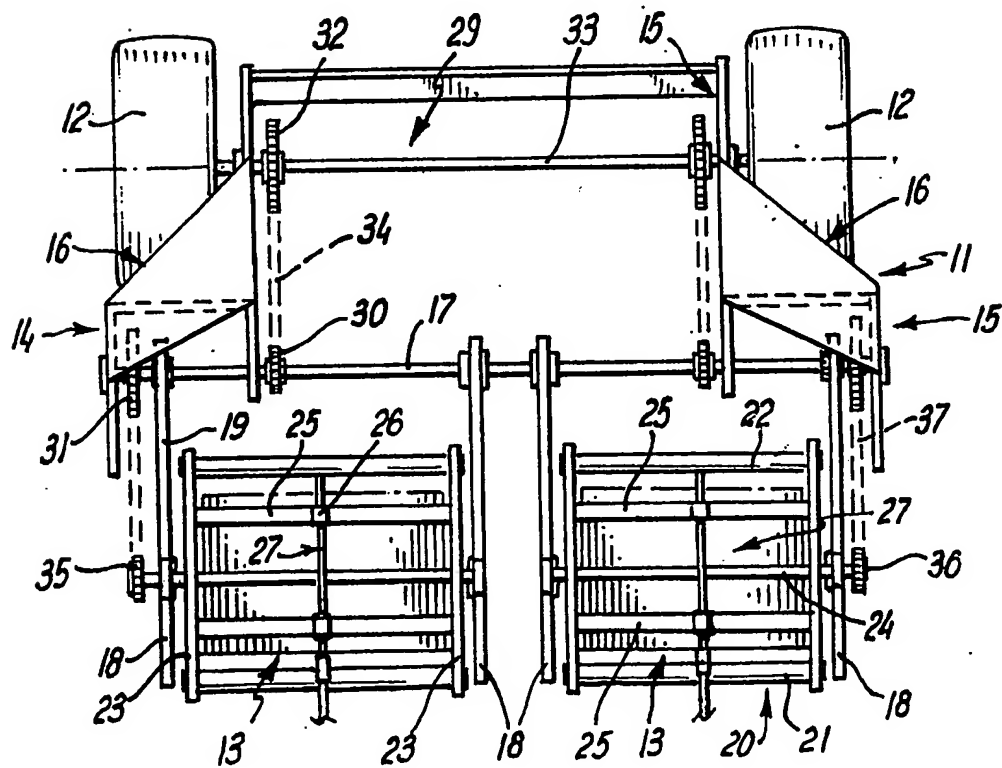


FIG. 2



SPECIFICATION

Turf care apparatus

The invention concerns turf-care apparatus, and has more particular, though not exclusive reference to a scarifier for attachment to a tractor vehicle in tandem relationship therewith.

Difficulty is experienced in satisfactorily subjecting a grassed sport surface to a scarifying operation in circumstances where the surface in question is other than flat, as is the case, for example, with golf course fairways, since damage may be caused to the peaks of an undulating surface whereas the troughs of such surface may be inadequately treated.

The object of the present invention is to provide an apparatus wherein the difficulties aforesaid may be avoided, in whole or in part.

According to the present invention there is proposed turf-care apparatus comprising a rotatable treatment cylinder characterised by spaced support rollers provided forwardly and rearwardly of the said cylinder closely adjacent thereto, the support rollers being positionally adjustable about remote pivot axes and serving, upon such adjustment, to vary the position of the cylinder relative to the surface to be treated.

According to a preferred feature, the support rollers are pivotal about a common axis.

According to a further preferred feature, the said common axis is disposed above the treatment cylinder.

According to a still further preferred feature the adjustment means comprises an arrangement adapted simultaneously to effect adjustment of both rollers.

In order to accommodate surface undulations in the direction of the cylinder axis the apparatus can be provided with independently mounted treatment cylinders arranged in coaxial side-by-side disposition.

The apparatus will ordinarily include a chassis having ground support wheels, the or each treatment cylinder being pivotally mounted on said chassis and may further include a drive means between the ground wheels and each cylinder to effect rotation of the latter in the same direction as and a greater rate of angular rotation than said ground wheels.

The invention will now be described further, by way of example only, with reference to the accompanying drawings, illustrating one embodiment thereof and in which:—

Fig. 1 is a diagrammatic side elevation of a scarifier embodying the invention; and

Fig. 2 is a plan view of a part of the arrangement shown in Fig. 1.

Referring now to the drawing, a scarifier comprises a rigid chassis 11 for attachment to the three point linkage (not shown) of a tractor vehicle and having a pair of ground wheels 12 whereby the chassis 11 is supported in trailer fashion behind the tractor, and a pair of scarifier units 13 pivotally mounted in side-by-side disposition on the chassis 11 in tandem relationship therewith.

The chassis 11 includes spaced side plate structures 14, 15 connected by transverse elements, the side plate structures 14, 15 being of cranked configuration when considered in plan, to provide wheel receiving recesses 16 at the respective sides of the chassis and at the forward end thereof. A cross shaft 17 is mounted in and extends between the side plate structures 14, 15 at the rearward end thereof.

Each scarifier unit 13 includes spaced parallel side plates 18 having forwardly directed arms 19 for mounting on the cross shaft 17, the side plates carrying a scarifier blade assembly 20 therebetween.

In order to locate the scarifier blade assembly 20 in an appropriate position relative to the surface under treatment, the unit 13 is supported on ground rollers 21, 22 positioned forwardly and rearwardly, respectively, of the scarifier blade assembly, the rollers 21, 22 being carried from the side plate 18 by

respective pairs of support arms 23, of arcuate form pivotal on a common support shaft 24 extending between the plates 18 and positioned above the scarifier blade assembly 20, the corresponding arms of each pair of support arms 23 being connected by a respective transverse bar 25 closely adjacent to the common support shaft 24.

At a position intermediate the side plates 18, each transverse bar 25 is provided with an upstanding lug 26, corresponding lugs 26 being in alignment and connected by an arrangement 27 including a rod 27a which passes rotatably through the forward lug 26 and is threadedly engaged in a hole in the forward lug 26. A collar 27b is fixed to rod 27a rearwardly of rear lug 26 and the rear of each rod 27 is connected by a universal joint to a rotatable drive rod 28 provided with a handle (not shown) whereby the rod 28 can be turned to rotate rod 27 to adjust the spacing of lugs 26 to adjust the operating height of blades 13.

A drive means 29 is provided whereby the scarifier blade assemblies are driven, such drive means including a pair of chain sprockets 30, 31 adjacent each end of the cross-shaft 17, the smaller sprocket 30 in each instance being connected to a respective corresponding and larger sprocket 32 on a ground wheel axle 33 by a drive chain 34 and the larger sprocket in each instance being drivingly connected with a respective corresponding and smaller sprocket 35 on the axle 36 of the respective scarifier blade assembly through a chain 37. A jockey pulley 38 is provided for each respective drive chain 34, 37 and serves to maintain the tension therein, a free-wheel arrangement can be provided in each drive, for example, at either of sprockets 30, 32 to allow differential rates of rotation of the two sets of blades 13 when the unit is cornering.

As will readily be appreciated, the scarifier blade assemblies 21 will be driven by and in the same direction of rotation as the ground wheels 12, and will, furthermore, have a rate of angular rotation substantially higher than that of such ground wheels according to the gearing arising from the combination of sprockets adopted and their respective sizes.

By providing side-by-side scarifier units each capable of independent pivotal motion in a vertical direction about the axis of cross shaft 17, so is the arrangement capable of adjusting, to a degree, to surface undulations in the transverse direction of the scarifier, whilst the provision of support rollers in advance of and rearwardly of the scarifier blade assemblies, and in close proximity to such assemblies, will serve more effectively to maintain the scarifier blades 39 in a requisite disposition relative to the surface under treatment in the event of surface undulations in the direction of movement of the scarifier.

The invention is not limited to the exact features of the embodiment hereinbefore described, since alternatives will readily present themselves to one skilled in the art. Thus, for example, whilst the invention is disclosed in the context of a scarifier, a like support arrangement may be of application in relation to the cutter cylinders of a mower.

Whilst it is preferred that the support rollers be mounted for pivotal motion about a common axis disposed above the cylinder or cylinders, a like effect may be achieved by mounting the rollers on the cylinder axis.

The drive to the rotating elements such as blades 13 can be such as to drive them in a direction opposite to the direction of rotation of the ground wheels if desired.

CLAIMS

1. Turf-care apparatus comprising a rotatable treatment cylinder characterised by spaced support rollers provided forwardly and rearwardly of the

said cylinder closely adjacent thereto, the support rollers being positionally adjustable about remote pivot axes and serving, upon such adjustment, to vary the position of the cylinder relative to the surface to be treated.

2. Apparatus as claimed in claim 1, wherein the support rollers are pivotal about a common axis.

3. Apparatus as claimed in claim 2, wherein the said common axis is disposed above the treatment cylinder.

4. Apparatus as claimed in claim 1, 2 or 3 wherein the adjustment means comprises an arrangement adapted simultaneously to effect adjustment of both rollers.

5. Apparatus as claimed in any preceding claim and being provided with independently mounted treatment cylinders arranged in coaxial side-by-side disposition.

6. Apparatus as claimed in any preceding claim and including a chassis having ground support wheels, the or each treatment cylinder being pivotally mounted on said chassis.

7. Apparatus as claimed in claim 6 and further including drive means between the ground wheels and each cylinder to effect rotation of the cylinders in the same direction as or in the opposite direction to said ground wheels.

8. Apparatus as claimed in claim 7, wherein the cylinders are caused to rotate at a greater angular rate of rotation than the ground wheels.

9. Apparatus as claimed in claim 7 or 8 wherein a differential is included in the drives to the cylinders.

10. Turf-care apparatus substantially as hereinbefore described with reference to the accompanying drawings.